

EDITORIAL ARTICLES.

THE TREATMENT OF TUBERCULOUS PERITONITIS.

THE interest which has of late years been taken in tuberculous peritonitis is almost unbounded, and as a result the literature of the subject has attained to dimensions which are nearly as limitless.

Few diseases exhibit more curious problems in pathology, more protean aspects at the bedside, or more strange revelations of the unexpected than does the common affection now under consideration.

The morbid anatomy and clinical manifestations of tuberculous peritonitis it is not the intention to consider in this article, except to allude very briefly to a few matters which bear upon the subject of treatment.

No age is free from tuberculous inflammation of the peritoneum.

It appears to be most common between the ages of twenty and forty, while it is also frequently met with in children.¹

It is curious that authors are not agreed as to the influence of sex in the production of the trouble. Some say it is more common in males and others in females. Statistics obtained from *post-mortem* records appear to show that tuberculous peritonitis is more often met with in males, while the list of cases treated by operation show that the majority of the patients operated upon are females.² The latter circumstance has been explained by the fact that in women the peritonitis often starts from the pelvic organs and presents itself in a form which suggests and encourages operative treatment; whereas in males the condition is apt to be more general and to be associated with

¹ Osler, Johns Hopkins's Hospital Reports, Baltimore, 1890.

² Helmrich, Basel, 1892. See also Koenig, Central. für Chir., 1890, p. 657, and Wagner, Deutch. Arch. f. klin. Med., 1884, Bd. 34.

primary tuberculosis in a less favorable position or to appear in a form less suggestive of operation.

The *clinical phenomena* follow no uniform course and are susceptible of infinite variation. Sometimes the trouble begins acutely with rigor and fever attended by digestive disturbances, irregular bowels, colicky pains, and the local manifestations of peritonitis. Certain cases have in their early symptoms resembled typhoid fever. In an isolated example or so the first manifestations have been mistaken for those of perforative peritonitis.

In the great majority of instances the onset has been quiet and stealthy. There is some disturbance in the function of the stomach and intestine, some trifling colic, a steady swelling of the abdomen, and above all a steady wasting. There is irregular fever and a marked fitfulness in all the symptoms. Constipation alternates with diarrhea, and vomiting may become a notable symptom. In the course of the disease remissions and relapses, and periods of unaccountable improvement are common, but in spite of any hopeful signs there is a general evidence of losing ground and of undoubtedly declining.¹

The abdomen becomes considerably swollen and may exhibit almost every possible gradation and combination of tympanites and dulness of percussion. More or less exudation is usual, and this may be general or may be confined to one or more districts: the intestines may be matted together into a cyst-like mass, the omentum may be rolled up into a solid ball not to be readily distinguished from a substantial growth. Adhesions may lead to a multitude of curious phenomena discoverable on palpation. Here may be an area of resistance and there a void, here all the manifestations of coils of intestine bound down by bands and fillets, and there the signs of bowel floating free in a thin fluid. There may be the phenomena of abscess on one side of the abdomen and the physical signs of ascites on the other.

It is no matter of wonder that tuberculous peritonitis is very commonly the subject of a mistake in diagnosis.

¹ Burghausen, *Mith. aus der Tub. Polikl.*, October, 1892, and Vierordt, *Zeit. f. klin. Med.*, 1887-88.

The curious mimicry met with in this disease has led to the diagnosis of cyst of the mesentery or liver, of tuberculous kidney, of ovarian tumor, of cancer of the omentum or peritoneum, of peri-typhilitic abscess, of internal hernia, and of fibroma and sarcoma of the abdominal wall. In each of the instances mentioned—to quote no others—an operation has been carried out for the purpose of exploring or of relieving the condition imitated by this fantastic disease.

The *morbid anatomy* of the affection follows, moreover, on more regular lines. From an examination of bodies after death, it would appear that tubercle may reach the peritoneum direct from the pleura, through the diaphragm, or may spread to it from the intestine, or from a tuberculous mesenteric or retro-peritoneal gland, or may have had its starting-point in some tuberculous disease of the female generative organs.¹

Tuberculous peritonitis may be the only manifestation of tuberculosis, although it is more usually secondary to a like process elsewhere.

In the majority of cases a large quantity of exudation is present, the peritoneum is opaque, it tends to become thickened, and the intestinal loops are prone to adhere together, and the adhesions thus formed may be very firm.

The omentum is commonly rolled upwards, and is found adherent to the anterior abdominal wall. Its layers are matted together, and often show extensive tuberculous changes.

The mesentery tends to become thickened, but not to be so shrunken as the omentum. The intestines are usually distended, and the belly markedly and uniformly swollen. The umbilicus is often protruded.

The ascitic fluid present usually shows three to five per cent. of albumen. It is slightly opaque, greenish yellow, and but seldom blood-stained. In this exudation the tubercle bacillus is but rarely to be demonstrated. The fluid may persist after the tubercles have

¹ The pathogenesis of the disease is well dealt with by Borschke, *Virch. Archiv*, Vol. cxxvii, p. 121, and Phillips, *Göttingen*, 1890.

disappeared. Peritoneal effusion may depend upon tuberculous trouble in the retro-peritoneal tissue.

Now and then the mesenteric glands are found to be the seat of extensive tuberculous changes. They are seldom, however, conspicuous in the marked cases of peritonitis. The instances in which they are most prominent are commonly those in which there is either no peritonitis, or but a slight manifestation of it. These glands, when matted together, may form a large single tumor, which has been mistaken for an enlarged spleen or a movable kidney, or they may form many large and independent tumors, or numerous small and isolated glands may be found dotted over the whole of the mesentery. In three cases¹ in adults, the limited glandular tumors have been removed by operation. In one the mass was incised, scraped, and drained; in the second case the glands were enucleated, and in the third instance they were removed piecemeal. The first patient died of septic peritonitis, the two latter recovered.

Aldibert² records the case of a little boy, aged six, who presented symptoms of tuberculous peritonitis with ascites. Laparotomy was performed. No peritonitis was found, but numerous tuberculous glands secondary to tuberculous enteritis were met with. The abdomen was washed out and the wound closed. The patient made a good recovery.

Intestinal obstruction is not uncommon, as a result of tuberculous peritonitis, and may depend upon bands, upon the bending or kinking of intestine, upon the agglutination of the bowel loops, or upon intestinal paralysis.

The Treatment of Tuberculous Peritonitis by Laparotomy.—The early operations in this form of peritonitis were unintentionally performed. The abdomen was opened under the belief that the patient had an ovarian or other cyst. Tuberculous peritonitis was discovered, the abdominal wound was hastily closed, and, to the infinite surprise of the surgeon, the patient recovered.

¹ Quoted by Pic, Thèse, Lyon, 1890, and by Pean, Gaz. Hôpitaux.

² De la Laparotomie dans la Péritonite Tuberculeuse. Thèse de Paris, 1862.

The well-known case reported by Sir Spencer Wells was operated upon in 1862. Somewhat like operations were carried out by Petri, in 1874, and Dorhn, 1878. Koenig,¹ in 1884, published three cases of tuberculous peritonitis deliberately treated by laparotomy, and urged this measure as a regular mode of treatment.

In the consideration of the subject of the treatment as carried out at the present time, I cannot do better than adopt the arrangement and utilize the statistic of Aldibert, whose elaborate treatise on the subject forms, without doubt, the most valuable monograph of recent years.

In order that a fair idea may be obtained of the result of surgical treatment under the manifold conditions which tuberculous peritonitis presents, Aldibert classifies the disease under three headings,—

(1) The ascitic form; (2) the fibrous form; (3) the ulcerous form.

(1) *The Ascitic Form.*—(a) When acute and involving the whole peritoneal surface, the condition is that of acute miliary tuberculosis. More usually the tuberculous process, although in no way limited within the abdomen, is either (b) subacute or (c) chronic. In such cases, very numerous gray granulations, which tend to become confluent, are found all over the inflamed serous membrane. There is abundant ascites. The fluid is citron-colored, sometimes blood-stained, and rarely sero-purulent. No adhesions are discovered, or, if any be present, they are scanty and insignificant. Lastly, the peritonitis may be (d) chronic and encysted, the morbid appearances being the same, but the trouble being limited by adhesions.

In general terms, it may be said that the clinical features in the ascitic form are marked by malaise, fever, headache, wasting, vomiting, and constipation. There is meteorism of the abdomen, which is tender, and which presents evidences of ascites.

(2) *The Fibrous Form.*—In this variety of the trouble it is apparent that the tuberculous process is moving in the direction of recovery. There is a considerable development of fibrous tissue, and

¹ See his paper in *Central. für Chir.*, 1890.

evidences of an inflammation of a robust type. Ascites, if present, is always slight. The fluid is clear and very rarely sero-purulent.

Two varieties of the fibrous form may be recognized: (a) The dry variety. Here tubercles are found disseminated over the whole serous membrane, without ascites and without adhesions. The tubercles are large, and are, by their size, distinguished from the nodules of acute miliary tuberculosis. This variety is supposed to represent a particular stage in the progress towards recovery. It is met with just after the absorption of the ascitic fluid, which absorption is a feature in the cases which are ending well, and just before the development of adhesions.

(b) The adhesive variety. This is marked by adhesions, which may be general and extensive. The coils of intestine may be matted together by firm bands, or a mass of adhesions may spread over the whole of the abdominal contents.

In its clinical aspect, the fibrous form is associated with a subacute and insidious onset, with moderate fever, no great impairment of health, the absence of marked vomiting, and constipation alternating with diarrhoea.

It may end in recovery or pass on to the ulcerous form.

(3) *The Ulcerous Form.*—This form is associated with caseation and the breaking down of the tuberculous products. Three varieties are described. (a) In the dry variety, when the abdomen is opened, there is presented a confused medley of intestines matted together and to the parietes, and a serous membrane covered with yellowish or gray adhesions, thick and infiltrated with caseous deposits in one place and still unchanged tubercle in another. The whole of the intestines may be buried in one fibro-caseous mass. When the adhesions and the attached coils are separated, innumerable loculi are made evident. Some contain clear fluid, some caseous material, some a chocolate-like matter, and a few may contain pus. The adhesions are of every possible variety, disposition, and density. Here and there two adherent coils of bowel may communicate by a fistulous opening, or there may be a fistula discharging faeces at the navel.

The suppurative variety exhibits precisely the same general changes as the dry form, but there is in addition more or less abundant suppuration, which may be (*b*) generalized or (*c*) encysted.

The clinical aspect of the ulcerous form is represented by patients who are wasted and miserable-looking, who have probably been long ill, who exhibit a considerable degree of fever, especially at night, who are feeble and the subjects of profuse sweating, together with vomiting and diarrhoea. The belly is large, and there are areas of dulness and of resonance, with hard masses in some parts and fluctuation in others.

Aldibert deals with 308 cases of tuberculous peritonitis of various forms treated by laparotomy.

The general results of this measure are presented in the following summary :

THREE HUNDRED AND EIGHT CASES OF TUBERCULOUS PERITONITIS TREATED
BY LAPAROTOMY.

I. *The Ascitic Form.*

- (*a*) Acute cases; 2, both ending fatally.
- (*b*) Generalized, subacute; 18 cases, 7 deaths. Mortality 38.8 per cent. Cures 61.2 per cent.
- (*c*) Generalized, chronic; 64 cases, 15 deaths. Mortality 23.4 per cent. Cures 73.4 per cent.
- (*d*) Encysted, chronic; 65 cases, 7 deaths. Mortality 10 per cent. Cures 80 per cent.

Summary of the 149 Examples of the Ascitic Form.

Deaths	31
Improved	2
Stationary	6
Cured	101
	140

Mortality due to operation, 2.6 per cent.

General mortality, 20 per cent.

General percentage of cures, 73.8 per cent.

35.4 per cent. of the total cures can be regarded as complete recoveries.

II. *The Fibrous Form.*

(a) Dry variety; 1 case, which recovered.

(b) Adhesive variety; 25 cases, 5 deaths.

General mortality in the 26 cases, 19.2 per cent.

Percentage of cures, 76.9 per cent.

Forty per cent. of the total number of cures can be regarded as complete recoveries.

III. *The Ulcerous Form.*

(a) Dry variety; 4 cases, 3 deaths.

(b) Suppurative, general; 6 cases, 2 deaths.

(c) Suppurative, encysted; 12 cases, 4 deaths.

General mortality in the 22 cases, 40.9 per cent.

Percentage of cures, 59 per cent., of which about one-fourth can be regarded as complete recoveries.

IV. *Tuberculous Peritonitis Arising from the Genital Organs.*

Forty-one cases, 14 deaths.

General mortality, 34.1 per cent.

Mortality from operation, 4.8 per cent.

Percentage of cures, 56 per cent.

To the above list of 238 cases the author adds 70 other cases of tuberculous peritonitis treated by operation, which are published without details. Among these 70 cases are 15 deaths.

General Summary.

Cases treated by operation	308
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Deaths	74
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Mortality due directly to operation, 2.5 per cent.

Cures, 215.

Percentage of cures, 69.8 per cent., of which number 33.4 per cent. can be regarded as complete recoveries.

In 50 of the above 308 cases tubercle was demonstrated, either histologically or bacteriologically. Among this number are 7 deaths, 39 cures, and 4 examples of non-improvement.

INDICATIONS FOR OPERATION AND METHODS OF OPERATING.

(1) *The Ascitic Form.*—It is needless to say that operation is contraindicated in cases in which general acute miliary tuberculosis exists. It has also proved to be of no avail in examples of acute

miliary tuberculosis limited to the peritoneum. In the subacute and chronic forms, operation has been attended with good results.

It will be seen that the best effects have followed in the chronic cases, and especially in those in which the peritonitis was encysted. The existence of fever is no bar to operation, and it has not been shown that the laparotomy has caused the tuberculous process to become more diffused about the body. It has been estimated that in the medical treatment of the ascitic forms, 9.5 per cent. are cured, 19 per cent. die, and 71.5 per cent. remain unimproved.

With regard to the method of operating, it has been shown that repeated puncture is of no avail in the great majority of instances. It is uncertain, imperfect, may lead to haemorrhage, and has led to fatal wound of the gut. Every variety in the method of performing laparotomy has been placed on record. In some, after a simple, free incision with evacuation of the fluid, the abdominal wound has been closed. In other cases the peritoneal cavity has been flushed out, either with sterile water or some antiseptic solution, and the wound then closed. In a third class of cases the serous sac has been drained, either with or without a previous flushing. In a fourth series the peritoneum has been treated with some drug; such as iodoform, iodine solution, or solution of carbolic acid, or of corrosive sublimate.

In the cases of generalized peritonitis the best results have followed simple incision, without either flushing or drainage. The cases treated by irrigation show 72.5 per cent. of cures; those not irrigated show 74.3 per cent. of cures.

Drainage is not necessary, and, indeed, drainage of the whole cavity is impossible. Relapses are as common in the cases drained as in those not drained. The gauze drain is better than the rubber tube. Fistulae have been somewhat common after the use of the tube.

In opening the abdomen it is well to remember that the peritoneum may be considerably thickened, and that the gut may be

adherent to it. All the fluid should be evacuated, and the peritoneal cavity may, if necessary, be mopped out. Adhesions should not be disturbed, and the omentum, if extensively tuberculous and rolled up, may be excised.

In the encysted form it is desirable that the localized collection should be cut into directly. Irrigation is not called for, and those cases have done best in which no drain was employed. Sinuses are very apt to follow the use of the drainage-tube. If any drain be employed it should be of gauze.

In a few cases the wound has given way after the operation, and more fluid has escaped. In other instances faecal fistulae have formed, or the wound has become the seat of tuberculous ulceration.

Among the examples of operation in the ascitic forms, there were 14 relapses (in 140 cases); 3 were in children, and these were ultimately cured; 11 were in adults, of these 1 died, 3 remained stationary, and 7 recovered. In the whole series, therefore (140 cases), the percentage of relapses is only 9.4 per cent.

In five of the relapsed cases in adults, a second laparotomy was performed. Of this number 1 died, 2 were cured, and 2 remained unrelieved.

(2) *The Fibrous Form.*—In the dry variety, operation has not been advised by many, as it is assumed that the case is progressing towards cure. Aldibert, however, urges it. He points out that the laparotomy can do no harm, and that the case—if left alone—may relapse or pass on to the ulcerous form.

In the adhesive variety operation is seldom called for. The condition is one moving in the direction of cure, and it is the opinion of most surgeons that this form of tuberculous peritonitis may be left to medical measures.

Laparotomy may be carried out if there be much fever, if the health be failing, if suppuration be suspected, or if there be much pain or any symptoms of intestinal obstruction.

The operation is rendered very difficult by reason of the adhesions, which should be handled with the greatest care. The best

results have attended incision and irrigation without drainage. If many adhesions be broken down, then a drain is called for.

Several cases of faecal fistula have been noted in connection with operations upon this variety of peritonitis.

(3) *The Ulcerous Form.*—The operation is considered by most to be contraindicated in the dry form, and in those examples of the encysted form, in which the pus is pent up in numerous loculi. The complete evacuation of all these collections involves serious and widespread damage.

In all other forms of the trouble laparotomy followed by drainage is distinctly to be advised. In the majority of instances recorded the diseased serous cavity has been treated by irrigation.

In these cases the less the adhesions are disturbed the better.

Pic has made the following estimate of the prospects of a patient suffering from the ulcerous variety of tuberculous peritonitis. Of children treated without operation one-third recover, of adults treated without operation one-fifth recover, of cases treated by operation four-fifths recover.

The Manner in which Laparotomy Effects a Cure.—This subject has led to considerable speculation, but at present to no completely satisfactory answer. The operation does not act by producing adhesions, since, as a rule, none form. It would not appear to act by exciting a more robust inflammation, for in the majority of cases no such reaction is evident.

Lauenstein has assumed that the beneficial effect is due to the removal of the fluid and the admission of light, and he points out that light and the absence of moisture are hostile to bacterial growth. Cameron suggests that the incision allows of the escape of the ptomaines and toxines, which are produced by the bacteria. Mosetig-Moorhof considers that the main element in the cure is the admission of air into the peritoneal cavity. Nolen holds the same views, and has reported some cases of tuberculous peritonitis which were cured by pumping sterilized air into the peritoneal cavity.

Not a few writers ascribe the good effect of the simple incision to

modifications in the state of pressure within the abdomen and to an improved circulation, and more active absorption, due to some ill-defined readjustment of that pressure.

It is remarkable that an actual incision appears to be necessary, as repeated observations have shown that puncture of the serous cavity leads but seldom to any improvement.

FREDERICK TREVES.

WUNDERLICH ON CLINICAL OBSERVATIONS ON THE
EFFECT OF CHLOROFORM AND ETHER NARCOSIS
ON THE KIDNEYS.¹

WUNDERLICH has made examinations of the urine in 125 cases, before and after anaesthetization, in the clinic of Professor Bruns. Albumen was found in five cases before operation, but it was found after operation in eighteen cases. All of the five albuminous patients were anaesthetized with ether, and in three of these the amount of albumen was increased after the anaesthetic. Of the thirteen cases which showed albuminuria for the first after the administration of the anaesthetic, six had been given chloroform, six had been given ether, and one mixed narcosis. All of these patients had no fever on the day when the albuminuria developed, or only to a very slight degree. Antiseptic poison cannot be held accountable for the occurrence of albumen, for scarcely anything of this sort was used in the operations; only a small amount of iodoform powder was dusted over the sutured wounds, and, occasionally, a small bit of iodoform gauze, or an iodoform tampon was used. Acute anaemia was in no case a cause of the urinary changes, for in all of the operations but little blood was lost. It therefore remained only to regard the ether and chloroform as responsible for the kidney complications.

The albumen which appeared in these thirteen cases was only in a small amount, scarcely more than a trace, and gave simply a

¹ Beiträge zur klinischen Chirurgie, Band XI, Heft 2, 1894.